REMARKS/ARGUMENTS

Overview of the invention:

As track densities increase, it becomes increasingly important to prevent accidentally writing data outside the boundaries of a track, including on an adjacent track. A secondary lower magnetic pole design for a write head is described that achieves this by being closer to the ABS than the primary lower pole. It takes the form of a ledge that terminates at the ABS, said ledge resting on a non-magnetic layer.

Reconsideration is requested of all rejections based on objections to the drawings:

Both FIG. 4 and claim 4 have been amended so that all features recited in claim 4 appear in FIG. 4 and/or in FIG. 11. A copy of the amended FIG. 4 is attached with this paper.

The newly amended claim 4 is shown below, together with the number associated with each feature the first time it is mentioned:

4. A magnetic write head, having an air bearing surface (ABS 115), comprising:
on a substrate (15), a first layer of high magnetic permeability material (12), having, on a first side, an edge (42) whose surface is normal to said substrate and parallel to said ABS, that serves as a primary lower magnetic pole;
a first non-magnetic layer (91) that contacts said first layer of high magnetic permeability material only at said edge and extends away therefrom, said non-magnetic layer having a top surface that is coplanar with that of said primary lower magnetic pole;
a second layer of high magnetic permeability material (41) that serves as a secondary lower pole that fully covers and contacts said primary lower magnetic pole and said first non-magnetic layer, above which it serves as a ledge having a width;
a field coil (14) over, and insulated from, said primary and secondary lower poles;

an upper magnetic pole (11) that overlies said field coil, contact[[s]]ing said secondary lower pole at a second side that is opposite to said first side, and that is separated from said ledge at said first side by a second layer of non-magnetic material that is a write gap (13), said upper magnetic pole having, at the write gap, a width equal to said ledge width, whereby it defines a track width; and

said ledge extending away from said primary lower pole by an amount.

Examiner has requested that we provide a side view of FIG. 15. We have been unable to comply with this request as there is no FIG. 15. Additionally, we have amended the specification (specifically the description of the first embodiment) to ensure that every feature claimed in claim 4 is present in FIG. 4 or FIG. 11 and have provided cross-referencing information that should fully clarify the relationship between these figures and claim 4. Hopefully, this will eliminate the need for an additional figure.

Reconsideration is requested of the rejection of claim 4 under 35 U.S.C. 112:

In the limitation that starts "an upper magnetic pole that overlies...", "lower pole" has been amended to -- secondary lower pole—for which antecedent basis can be found in the preceding clause.

Reconsideration is requested of the rejection of claim 4 under 35 U.S.C. 102(b) as being anticipated by Stoev et al. (US 6724572):

We respectfully point out the following differences between what Stoev discloses, and the present invention:

(1) Stoev's first layer of high permeability material 208 in not on substrate 28, being separated therefrom by intervening layers 30 and 206. The corresponding layer in the present invention is layer 12 which lies on substrate 15. Since it is on, not merely over, substrate 15 there are no layers between layers 12 and 15,

(2) Stoev's layers 210 and 220 are not equivalent to layer 41 of the present invention for two reasons:

(a) Layers 210 and 220 do not fully cover and contact primary lower magnetic pole 208 as claimed in our claim 4. In fact, these layers cover and contact less than 10% of layer 208.

(b) Examiner refers to layers 210 and 220 as "of high magnetic permeability". This is at variance with Stoev's description of 210 as "pedestal 210 that couples the first pole layer 208 to the first pole tip 220" (col. 5 lines 37-40). Nowhere does Stoev refer to 210 as having high permeability. Furthermore the most important characteristic required of a coupling layer is that it have low coercivity so that it can transfer even low levels of magnetization between the two layers that it couples.

Most important of all, it would be counter-productive for 210 to have high permeability similar to 220 since this would result in a track width increase equal to the thickness of layer 210.

(3) Stoev's upper pole 72 is separated from ledge 220 by both secondary pole 68 as well as non-magnetic layer 45. The present invention claims only one layer (14) between ledge 41 and upper pole 11.

We may summarize the fundamental difference between Stoev and the present invention as being that Stoev's invention seeks to optimize throat height first and track width second while the present invention does the reverse.

Reconsideration is requested of the rejection of claim 5, 7, and 8 under 35 U.S.C. 103(a) as being unpatentable over Stoev et al. in view of Sasaki et al., claim 9 in view of Komuro et al., and claim 10 in view of Takano et al.

Applicant believes that claim 4 is now in condition for allowance and notes that all claims that have been rejected above under 35 USC 103 are dependent on claim 4 and therefore are believed to no longer be subject to rejection.

Examiner has neither rejected nor allowed claim 6. Clarification is requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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